BREEDING BIOLOGY AND CONSERVATION OF SILVERSWORDS*

Elizabeth Powell
Department of Botany
University of Hawaii at Manoa
3190 Maile Way
Honolulu, Hawaii 96822

The two species of silverswords on the Big Island, the Mauna Kea silversword (Argyroxiphium sandwicense DC) and the Ka'u silversword (A. kauense (Rock and Neal) Deg. and Deg.), have suffered serious population decline due to habitat disruption and grazing by feral ungulates, particularly feral sheep (Ovis aries) and mouflon (O. musimon).

Seed set data suggest that both of these silversword species are self-incompatible. Both species are primarily monocarpic, although polycarpic individuals are now common in the Mauna Kea silversword population. When a plant blooms, it must be cross- pollinated with another simultaneously blooming individual by flying insects. In small populations of silverswords, the chances of simultaneous blooming of two or more individuals within insect flight/interest distance may be small.

In Haleakala Crater, Maui, the Haleakala silversword (A. macrocephalum Gray) sets a higher percentage of seed per plant in good flowering years when many plants flower than in poor flowering years when few plants flower. Seed set for the Mauna Kea silversword is similar to the seed set of the Haleakala silversword in poor flowering years. Silverswords in small populations may be under a poor flowering year disadvantage for seed set in every flowering season. Regeneration is, therefore, expected to be low in small populations of silverswords.

I recommend that Big Island silverswords be protected from feral ungulates before regeneration in these populations ceases. Any further loss of individuals means a loss of regeneration capacity for the entire population. When regeneration ceases, extinction follows.

*ABSTRACT